SUSTAINABLE DEVELOPMENT

Workbook On

Minerals

DEVELOPMENT IN HARMONY WITH OUR ENVIRONMENT

Manitoba Round Table
on Environment & Economy

91-05560/

To Concerned Manitobans...

Manitoba's mineral industry is a major contributor to the provincial economy. It is a leading primary resource industry second only to agriculture. Revenue to the Province from direct mineral taxes, royalties, and fees has averaged $67 million annually over the past five years. Clearly, how we develop and conserve our mineral resources will affect our future well-being.

We are now consulting with Manitobans on policies which will guide and coordinate the development and protection of our natural heritage. These will be part of Manitoba's overall Sustainable Development Strategy. By preparing and implementing comprehensive management policies, our physical resources, including minerals, will better serve both our needs and those of future generations.

With your help, we will develop a strategy that best meets the needs of all Manitobans.

We look forward to hearing from you.

Honourable Gary Filmon
Premier of Manitoba

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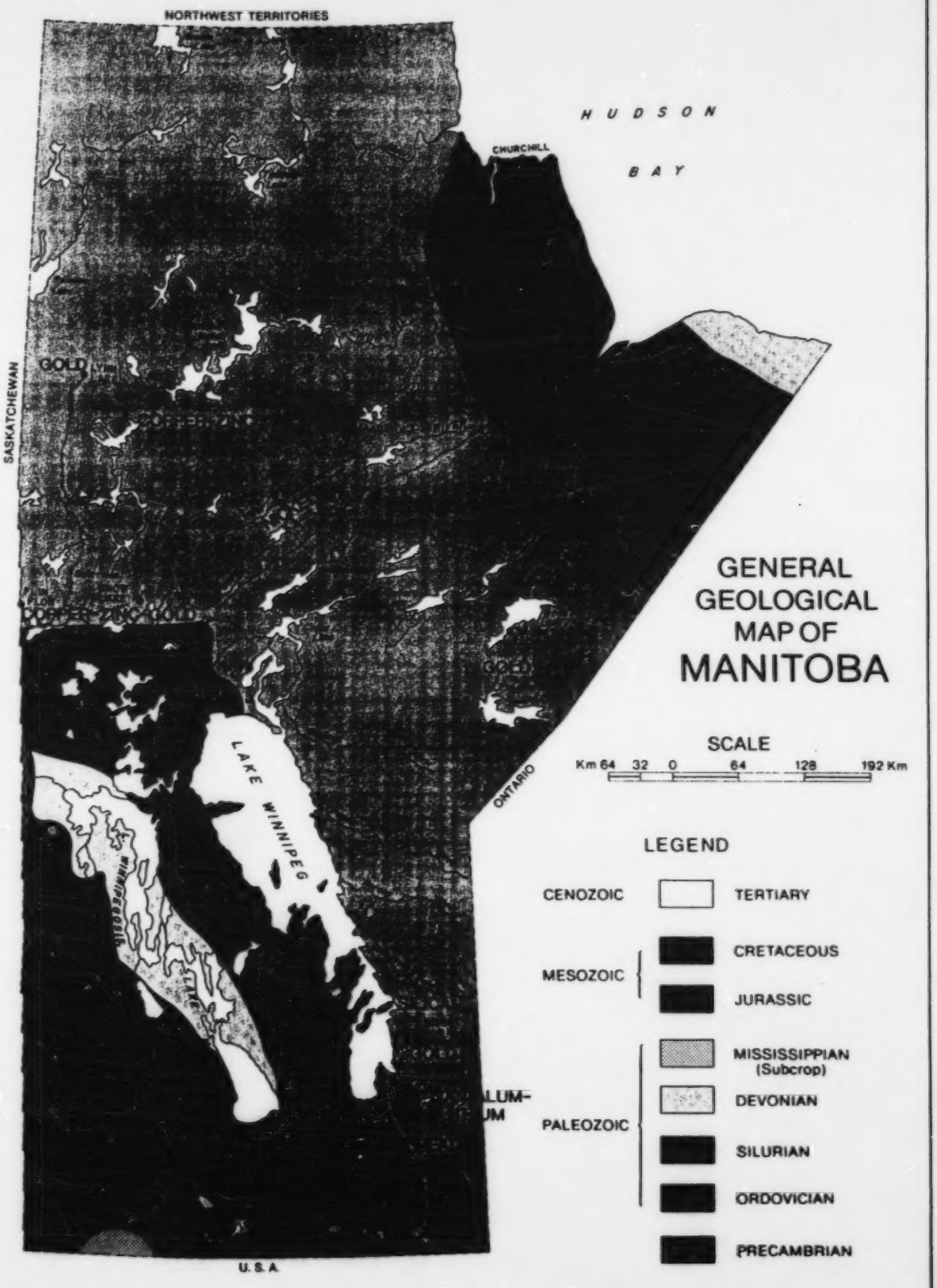


DEPARTMENT OF ENERGY AND MINES

PETROLEUM BRANCH 1980

Sustainable Development

"We have the power to reconcile human affairs with natural laws and to thrive in the process"

Our Common Future

Daily news events remind us that our relationship with the earth and its natural systems is constantly changing. Potential hazards of climate change, depletion of the ozone shield, and destruction of valuable agricultural lands are some of the more alarming consequences of the interlocking nature of the environment and the economy. Clearly humanity has reached a crossroads.

Despite these threats to human well-being, and the need to make changes, there is reason for optimism.

In the 1980's people realized that the goals of environmental protection and economic development can be mutually reinforcing. Sustained development is possible if we protect the environment and promote the wise and efficient use of our resources. At the same time we can protect the environment only if we have the economic means to do so.

Starting Worldwide

The origins of sustainable development lie in the Paris "Biosphere Conference" and the Washington D.C. Conference on "Ecological Aspects of International Development" held in 1968. In 1980, the World Conservation Strategy reinforced the importance of sustainable development. However, it was the World Commission on Environment and Development that brought global awareness of and support for sustainable development.

The Commission issued a report called Our Common Future. In its report, the Commission described sustainable development as paths of social, economic, and political progress that meet the needs of the present without compromising the ability of future generations to meet their own needs. The Commission also suggested a number of broad remedies for resolving and addressing environmental and economic problems. While the Commission offered general ideas, it left each nation to define sustainable development within the context of its own problems and public institutions.

In Canada

Canada's initial response was the establishment of the National Task Force on Environment and Economy. The Task Force, drawn from the private sector, business, government, and academic and leading environmental organizations issued its Report in September 1987.

In Manitoba

Acting on one of the recommendations of the National Task Force, the Government of Manitoba established the Manitoba Round Table on Environment and Economy in October of 1988.

The Manitoba Government considers the Round Table as the appropriate forum for defining sustainable development in Manitoba. The Manitoba Round Table on Environment and Economy is a forum at which concerned citizens and senior decision makers from business, non-government organizations, labour, and government can meet. There, they can discuss candidly environment-economy issues, develop ideas, and make recommendations directly to the Premier.

The Work of The Manitoba Round Table

The Manitoba Round Table has stated that sustainable development means environmentally sound and sustainable economic development. It is more accurately described by certain beliefs, a vision for Manitoba, a process, and principles and guidelines of sustainable development.

Beliefs

The Manitoba Round Table has accepted as part of the meaning of sustainable development the following beliefs:

1. **That we cannot continue to develop economicaliy unless we protect the environment.**
2. **That continued economic development will be needed to pay for important environmental initiatives.**
3. **That the needs of the present must be met without sacrificing the ability of future generations to meet their own needs.**
4. **That attention must be paid to long term effects of both environmental and economic decisions.**

SUSTAINABLE DEVELOPMENT

A Vision for Manitoba

"...the environment is where we all live; and development is what we all do in attempting to improve our lot ... The two are inseparable."

Our Common Future

Our vision for Manitoba is a sound environment and sustainable economic growth.

A sound environment means clean, safe and healthy air, land and water in which to live, work, and play.

Sustainable economic growth means quality growth which creates ongoing wealth that provides goods and services for both present and future generations of Manitobans in an environmentally sound manner.

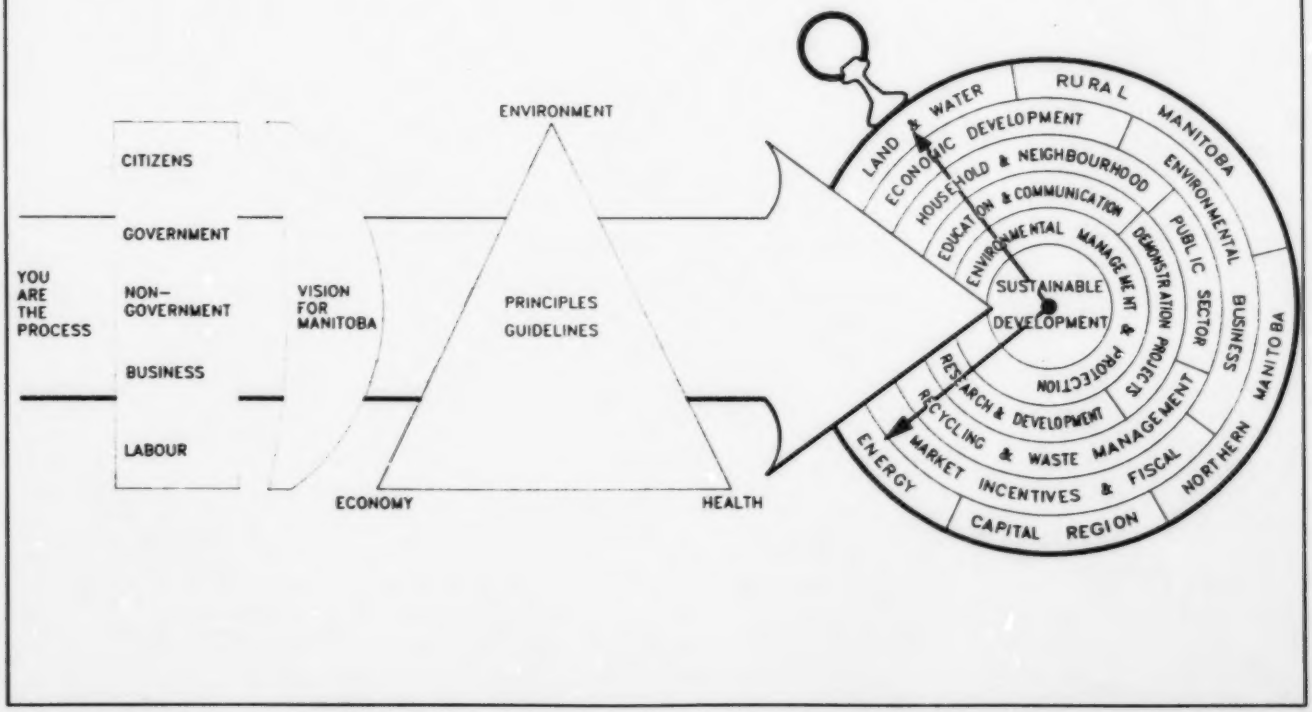
The Process

We want the best possible process for planning sustainable development. Our process promotes the participation of all citizens working together to chart a course for sustainable development in Manitoba.

Individuals, government, non-government agencies, business, and labour are all part of the process. Together we will determine the direction, goals, and policies that will guide the development of our resources.

We have prepared workbooks containing drafts of sustainable development strategies. We invite you to evaluate the strategies and provide input during public workshops to be held across the province. Your input will shape government policy.

From Vision to Action



PRINCIPLES OF SUSTAINABLE DEVELOPMENT

Our vision of environmentally sound and sustainable economic growth for Manitoba will be governed by the following principles and guidelines. They will be reflected in the policies, plans, programs, and processes of all strategies including minerals..

1. Integration of Environmental and Economic Decisions

This principle requires that we ensure economic decisions adequately reflect environmental impacts including human health. Environmental initiatives shall adequately take into account economic consequences.

2. Stewardship

This principle requires that we manage the environment and economy for the benefit of present and future generations. Stewardship requires the recognition that we are caretakers of the environment and economy for the benefit of present and future generations of Manitobans. A balance must be struck between today's decisions and tomorrow's impacts.

3. Shared Responsibility

This principle requires that all Manitobans acknowledge responsibility for sustaining the environment and economy, with each being accountable for decisions and actions, in a spirit of partnership and open cooperation.

4. Prevention

This principle requires that we anticipate, prevent, or mitigate significant adverse environmental (including human health) and economic impacts of policy, programs, and decisions.

5. Conservation

This principle requires that we maintain essential ecological processes, biological diversity, and life-support systems of our environment; harvest renewable resources on a sustained yield basis; and make wise and efficient use of our renewable and non-renewable resources.

6. Recycling

This principle requires that we endeavour to reduce, reuse, and recover the products of our society.

7. Enhancement

This principle requires that we enhance the long term productive capability, quality, and capacity of our natural ecosystems.

8. Rehabilitation and Reclamation

This principle requires that we endeavour to restore damaged or degraded environments to beneficial uses. Rehabilitation and reclamation require ameliorating damage caused in the past. Future policies, programs, and developments should take into consideration the need for rehabilitation and reclamation.

9. Scientific and Technological Innovation

This principle requires that we research, develop, test, and implement technologies essential to further environmental quality including human health and economic growth.

10. Global Responsibility

This principle requires that we think globally when we act locally. Global responsibility requires that we recognize that there are no boundaries to our environment, and that there is ecological interdependence among provinces and nations. There is a need to work cooperatively within Canada, and internationally, to accelerate the merger of environment and economics in decision making and to develop comprehensive and equitable solutions to problems.

FUNDAMENTAL GUIDELINES

1. Efficient Use of Resources

We shall encourage and support development and application of systems for proper resource pricing, demand management, and resource allocation together with incentives and disincentives to encourage efficient use of resources and full environmental costing of decisions and developments.

2. Public Participation

We shall establish appropriate forums which encourage and provide opportunity for consultation and meaningful participation in decision making processes by all Manitobans. We shall endeavour to ensure due process, prior notification, and appropriate and timely redress for those affected by policies, programs, decisions, and developments.

3. Understanding and Respect

We shall be aware that we share a common physical, social, and economic environment in Manitoba. Understanding and respect for differing social and economic views, values, traditions, and aspirations are necessary for equitable management of these common resources. Consideration must be given to the aspirations, needs, and views of various regions and groups in Manitoba.

4. Access to Adequate Information

We shall encourage and support the improvement and refinement of our environmental and economic information base and promotion of the opportunity for equal and timely access to information by all Manitobans.

5. Integrated Decision-Making and Planning

We shall encourage and support decision making and planning processes that are open, cross sectoral, incorporate time horizons relevant to long term implications, and are efficient and timely.

6. Substitution

We shall encourage and promote the development and use of substitutes for scarce resources where they are both environmentally sound and economically viable.

LAND AND WATER STRATEGY

The Land and Water Strategy is part of Manitoba's Sustainable Development Strategy. It is being developed through a series of workbooks like this one. Workbooks on water, soil, and forests have already been prepared.

The Land and Water Strategy addresses the development and conservation of our natural resources. The development and conservation of these resources are vital to our economic future.

We have not always treated our land and water resources well. The time has come for us to protect our natural heritage. What we do on land affects our water. Equally, what we do with our water can affect land use and development. The Land and Water Strategy will guide the management of our land and water resources. The Strategy will help us to both develop and to protect our natural resources.

The goals of the Land and Water Strategy are:

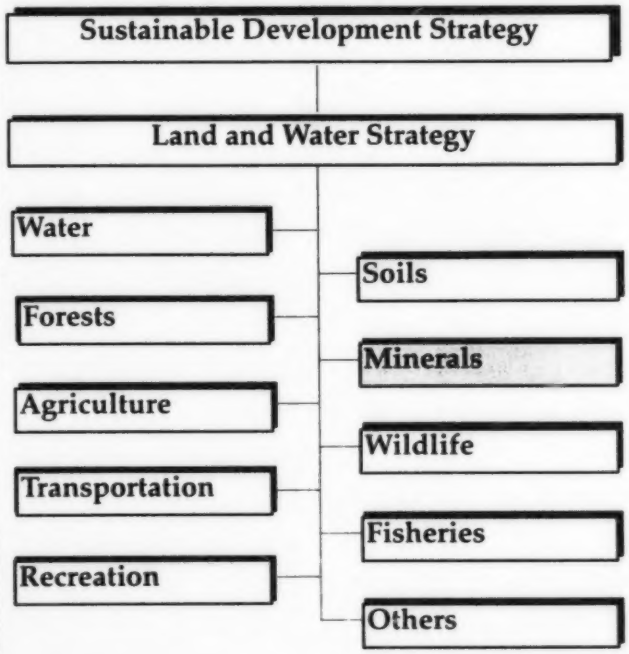
To sustain resources, enhance productivity, and improve environmental quality, including human health.

To improve and diversify income and job opportunities.

To manage resource and related activities so as to preserve development options for future generations.

To protect natural systems, maintain the genetic diversity of species, and preserve the resilience and productivity of the ecological system.

Application of the Land and Water Strategy will produce major benefits for all Manitobans. If we diversify the economy and protect the environment and resources that support the economy, rural communities will stabilize and prosper. Urban communities will also benefit from resource management that improves recreational opportunities, preserves endangered species, and contributes to the economic well-being of Manitobans.



As part of the Provincial Government's commitment to Sustainable Development, a Land and Water Strategy is being prepared with ***Minerals*** *as the fourth resource to be addressed.*

Why a Mineral Strategy?

The mineral industry contributes in many ways to the high quality of life in Manitoba.

Minerals are indispensable in our daily lives. We use minerals which have been processed into many forms and combinations and incorporated into a wide range of products. For example, nickel, copper, and zinc are essential in the manufacturing of motor vehicles, airplanes, industrial equipment, home appliances, recreation products, and health care equipment. We use petroleum as a fuel in industry and transportation and as a raw material for plastics. We will continue to need sand and gravel, gypsum, limestone, and other industrial minerals for roads, railway lines, and sewer and water facilities that will ensure our physical and economic well-being.

Manitoba's mineral industry is a major contributor to the provincial economy. In fact, it is a leading primary resource sector second only to agriculture. Over the past five years the total value of mineral production has averaged $1.2 billion per year. The industry directly creates jobs, income, trade flow, exports, and government revenues. It is an essential participant in regional development. There are also indirect benefits when the mineral industry buys products and services from other industries. The mineral industry's contributions to government revenues help to pay for health and social programs as well as future environmental enhancement.

Management of Manitoba's mineral resources is becoming more complex. We need a new approach. We must develop our mineral resources in an environmentally sound manner. The result should be our continued prosperity.

Please consider the draft policies presented in this workbook. Your comments and suggestions are welcome. Your input will shape government policy.

Our challenge is to minimize the environmental damage associated with mineral development. Mineral exploration, development, and processing activities must be environmentally sound. At the same time we must consider the impact of environmental standards and guidelines on the mineral industry. To help us, we need better information systems, more research and development, and incentive programs.

We should also try to preserve unique geological landforms.

OBJECTIVE 1:
To ensure that mineral development activities are practiced in an environmentally sound manner, including sensitivity to the impacts on human health.

OBJECTIVE 2:
To ensure that environmental management and protection measures consider economic impacts.

Mining headframes are comparable in size and shape to grain elevators.

POLICY 1.1

Data collection and monitoring systems shall be enhanced and developed so that the environmental performance of the mineral industry, including implications for human health, can be evaluated.

POLICY 1.2

Environmental enhancement and protection shall be encouraged by promoting appropriate research and development.

NOTES:

POLICY 1.3

Appropriate incentives, programs, and where necessary, regulations, shall be developed and supported to minimize negative environmental impacts and effects on human health associated with mineral development.

POLICY 1.4

Mineral development projects shall include full cost accounting of environmental impacts, mitigation, and protection.

Petroleum production can co-exist with agriculture

POLICY 1.5

Provincial Acts and regulations shall be periodically reviewed to accommodate changing environmental, human health, social, and economic circumstances.

POLICY 1.6

Rare, endangered, and unique natural and heritage resources, including unique geological landforms, shall be identified and protected from development.

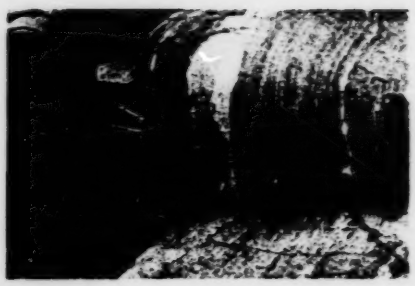
NOTES:

POLICY AREA 2 — SUPPLY AND AVAILABILITY

Mineral development relies on a secure supply of mineral resources. We can enhance the supply of mineral resources through efficient exploration, extraction, processing, and recycling. Appropriate incentives can encourage exploration and development. We can enhance the availability of mineral resources by protecting areas of significant mineral potential for development. Fair and equitable access to these resources should continue. Finally, investment in our mineral industry has to be protected.

OBJECTIVE:

To make available and ensure wise use of mineral resources in a manner which optimizes the long term social, environmental, and economic benefits and opportunities to Manitobans.



Ongoing geological investigations will enhance the future supply of minerals.

POLICY 2.1

Areas of significant mineral potential shall be identified and managed to allow for environmentally sound exploration and development.

POLICY 2.2

Supply shall be enhanced by providing appropriate incentives for mineral exploration and development and supporting research into more effective methodologies and technologies.

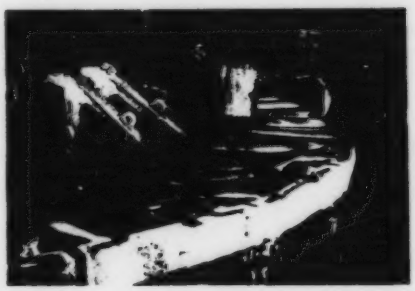
POLICY 2.3

Efficient extraction and use of mineral resources and efficient waste management shall be encouraged.

NOTES:

POLICY 2.4
Recycling of mineral products shall be encouraged.

POLICY 2.5
Mineral management and mining recording systems shall provide for security of tenure and shall be reviewed on a regular basis.



Improved processing of minerals can reduce waste by-products.

POLICY 2.6
The needs of communities for aggregate materials shall be considered and addressed.

NOTES:

We need to create a positive business climate that will maintain existing mineral operations and promote future mineral development. The development of these resources, which are concentrated within many regions throughout the province, continues to have a significant impact on the provincial economy and regional development, especially communities in northern Manitoba.

Most of Manitoba's mineral production is traded internationally and is therefore sensitive to changing supply and demand conditions. Rising mineral prices may lead to increased prosperity whereas falling prices may result in economic instability.

Development of our mineral resources is essential for our economic growth and maintenance of our standard of living. Industrial society could not exist without mineral products. All sectors of Manitoba's economy depend directly or indirectly on minerals extracted from the earth.

How can we maintain and promote mineral development? We can expand the industry's economic base by developing our industrial mineral resources, promoting new mineral products and encouraging new allied manufacturing industries. The economic and social benefits of mineral development can be optimized through appropriate financial mechanisms. The pursuit of equitable trade and regulatory regimes will help to provide a positive business climate. However, sound environmental management is as necessary to sustainable development as prudent financial management. The mineral industry must use environmentally sound procedures throughout the mineral development process.

Many northern communities are economically dependent upon mineral development.

OBJECTIVE 1:
To achieve a positive business climate for mineral development which is environmentally sound and protects human health.

OBJECTIVE 2:
To promote an integrated and diversified economy.

OBJECTIVE 3:
To achieve efficient use of minerals.

NOTES:

POLICY 3.1
Appropriate incentives to encourage environmentally sound mineral development shall be established.

POLICY 3.2
Development of new and expanded markets for mineral resources shall be encouraged and supported.

POLICY 3.3
Research to improve environmental performance, safety, and efficiency of mineral development activities shall be encouraged.

POLICY 3.4
More and diversified processing of minerals, including research and development into new mineral products in Manitoba, shall be encouraged if economically viable and environmentally sound.

POLICY 3.5
Adoption of equitable standards and fair trade practices within national and international markets shall be promoted.

POLICY 3.6
Economic and social benefits of mineral developments shall be optimized for Manitobans through appropriate financial mechanisms.

POLICY 3.7
Labour and management skills shall be enhanced by training and education.

POLICY 3.8
Costs of developing, operating, and maintaining mineral resource roads shall be apportioned among the beneficiaries in accordance with their share of benefits.

Ongoing research and development can enhance safe working conditions.

NOTES:

We want to balance economic development with the protection of human health and the environment. To achieve this balance we need an interdisciplinary approach to our current land and resource management processes. We must find ways to integrate minerals management with the management of other natural resources. The management process should also encourage public participation in decision making. We can support the process with easier access to better economic, land use, and environmental information.

The mineral strategy must address the loss of potential mineral lands from mineral exploration and development. It should also improve the techniques for identifying and resolving land use conflicts.

Integrated resource management can enhance depleted quarries.

OBJECTIVE 1:
To ensure that mineral development interests and concerns are considered in land and resource use planning.

OBJECTIVE 2:
To ensure plans for mineral development address social, environmental, and economic issues.

OBJECTIVE 3:
To improve the quality and availability of information used in planning and managing mineral development so that decision making is more efficient and effective.

POLICY 4.1

All land and resource use plans shall consider and address issues related to mineral exploration, development users, and the environment.

NOTES:

POLICY 4.2

Mineral development activities should be planned and managed so that land use related environmental, health, social, and economic impacts are taken into account.

POLICY 4.3

Public participation in mineral development planning through appropriate forums and decision making on a timely basis, shall be encouraged.

POLICY 4.4

Processes and techniques for identifying and resolving integrated land use issues shall be developed.

POLICY 4.5

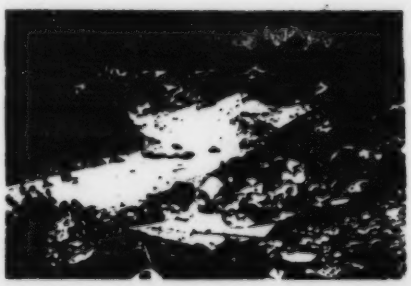
Baseline data systems shall be developed and appropriate information made available for the assessment of potential social, environmental, human health, and economic impacts of proposed mineral developments.

POLICY 4.6

Integrated management shall be supported by the development of appropriate programs and forums.

POLICY 4.7

Government review processes, at all levels, shall be examined regularly to ensure they are efficient, avoid duplication, and expedite the assessment of mineral exploration and development activities.



Improper surface uses can spoil mineral deposits prior to depletion.

NOTES:

POLICY AREA 5 — PUBLIC AWARENESS

Public awareness and participation are critical to the implementation of the sustainable development strategy. Clear lines of communication and educational programs will give industry, special interest groups, and the general public a better understanding of the economic and environmental concerns of the minerals sector. Government and industry will be encouraged to provide information about the environmental, social, human health, and economic impacts of mineral development.

OBJECTIVE:

To improve understanding of interrelationships among mineral resources, the environment, human health, and the economy.

Public participation in "open houses" and seminars can provide a better understanding of the mineral industry.

POLICY 5.1

Educational and informational programs shall be developed and supported in cooperation with schools, governments, non-government organizations, and business.

POLICY 5.2

The state of Manitoba's mineral industry shall be regularly assessed, documented, and made public.

NOTES:

POLICY 5.3

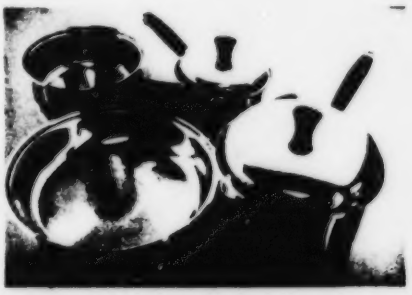
Projects demonstrating safe and environmentally sound mineral development shall be encouraged.

POLICY 5.4

Recognition shall be provided for outstanding achievements that foster environmentally sound mineral development.

POLICY 5.5

Public information respecting mineral management activities shall be made more accessible.



Minerals are indispensable in our daily lives.

NOTES:

REHABILITATION

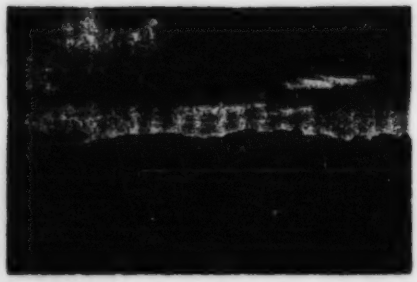
Environmental damage or degradation caused by mineral development must be restored to a condition that is safe, stable, and compatible with adjacent lands. These policies address issues related to the repair of environmental damage. We will have to include the costs of restoring the environment in our evaluation of mineral development.

OBJECTIVE 1:

To rehabilitate lands disturbed by mineral development activity to a condition or use that is environmentally safe, stable, and compatible with adjoining lands.

OBJECTIVE 2:

To ensure that reclamation and decommissioning costs are recognized as a cost of development and receive fair tax treatment by all levels of government.



Rehabilitated quarries can be reclaimed for crop production.

POLICY 6.1

Guidelines and standards concerning rehabilitation of mineral lands shall be developed and implemented.

POLICY 6.2

Lands disturbed by mineral development activity shall be rehabilitated to appropriate standards.

POLICY 6.3

The decommissioning and rehabilitation of mineral lands shall be included as a cost of mineral development.

POLICY 6.4

Tax legislation shall be reviewed and amended to provide fair tax treatment for rehabilitation costs.

NOTES:

Natural resources development creates employment, stimulates regional development, and generates revenues to the Crown. Mineral resources, however, are non-renewable. Eventually mineral deposits are exhausted or become too costly to develop. Although we try to extend the life of any particular deposit with exploration programs, increased recovery efficiencies, and favourable pricing mechanisms, mine closure is inevitable.

There are ways that governments and industry can help when mines close. New programs should encourage and direct mineral exploration into areas surrounding communities threatened by mine closures. Access roads into new exploration sites should be improved and developed. We can promote community stability through programs that encourage economic diversification.

OBJECTIVE:

To minimize the environmental, economic, and social impacts associated with mine shutdowns and closures.

Educational programs assist in minimizing the social impacts associated with mine closures.

POLICY 7.1

Programs and incentives to minimize the social, environmental, and economic impacts associated with shutdowns and mine closures shall be developed.

POLICY 7.2

Programs shall be developed to encourage and direct exploration into areas threatened by shutdowns and mine closures.

NOTES:

All parts of society must participate in sustainable development. There are things that each of us can do to foster sustainable mineral development. For its part, government will establish a specific and timely action plan. The government also encourages individuals and businesses to do the same.

The following ideas are presented for your consideration.

The Individual

Your cooperation and assistance are vital for the success of sustainable development. Please participate in the sustainable development process. Here are some actions you can take.

- Help develop and participate in recycling programs. By recycling bottles, cans, and paper you can help to reduce the consumption of energy and minerals used in their production. Encourage your friends and neighbours to do the same.
- Alter your lifestyle and change consumption patterns. When possible use public transit and car pools, maintain vehicles in good working order, and live in energy efficient homes.
- Evaluate your purchases based on quality, efficiency, and longevity. Make sure new appliances are energy efficient and durable. Buy products that can be repaired.
- Participate in public forums dealing with sustainable development matters. Express your views and opinions to leaders in business and government.
- Find out how we use mineral products in our everyday lives. A visit to the library, university, or government department can provide useful sources of information about minerals. Become informed!

Government

A. Planning Process

We have many planning processes that deal with land use and environmental concerns. We propose these improvements in order to encourage informed decision making.

- Avoid duplication in planning processes.
- Expedite the approval process.
- Provide forums and processes for conflict resolution.
- Provide improved technical information.
- Offer a single point of entry to government for mineral development—a one window approach.
- Make sure rules are known and clearly understood by developers.
- Increase public consultation and access to information.
- Review land use policies guiding development to ensure that they reflect principles of sustainable development.
- Develop a new planning process for the preparation of plans for each of Manitoba's lake or river basins. These plans will integrate the environmental, economic, and social implications of mineral development with the sustainable development of other natural resources.
- Make environmental impact assessment requirements the same for various processes and levels of government.
- Negotiate agreements designed to resolve conflicts about land and water use.
- Apply the principles and guidelines of sustainable development to the creation of government policy and statutes that relate to environmental protection and economic development.

B. Environmental Impact Assessment Process

The provincial Environment Act requires an environmental impact assessment of specified proposed mineral development projects. Potential impacts including types, quantity, and concentration of pollutants that may be released into the air, water, or land are determined and evaluated. The Act also requires a description of the environmental management practices that will be used to prevent or mitigate undue environmental impacts.

C. Mineral Management Areas

Mineral exploration and development have not been allowed on certain tracts of potential mineral lands. This trend may block economic development. The government could identify areas of significant mineral potential and allow environmentally sound mineral development. In mineral management areas multiple land use will be practiced. For example, other activities like fishing or farming would also be permitted.

D. Rehabilitation of Aggregate Deposits

New standards for rehabilitation of aggregate deposits are being drafted. Mining lands will be returned to a use compatible with the adjacent lands. Under the proposed draft regulation a rehabilitation fund would be established. This fund would pay for the rehabilitation of depleted aggregate deposit sites to a use compatible with adjacent lands.

E. Environmental Research

The government could encourage cooperative research programs. These programs could include:

- Evaluating the effect of mining on the environment.
- Designing appropriate standards for mine effluents.
- Developing technology that will minimize environmental impacts.

F. Regulations and Incentives

Incentives could be used to encourage sustainable development. The incentives should be publicized and generally available. Regulations will be carefully designed to achieve specific goals. They should be reviewed regularly to assess their effectiveness.

Business/Industry

If sustainable development is to be achieved in Manitoba, industry must play a key role in the process. The mineral industry can provide leadership, technical assistance in resolving environmental issues, and information that will improve decision making.

The following list outlines some things that the industry can do.

A. Environmental Activities

- Incorporate the principles and guidelines of sustainable development into all company activities.
- Train staff to deal with environmental problems such as accidental spills.
- Create and fund programs that address environmental issues.
- Establish an environmental review process. Report findings to boards and shareholders.
- Incorporate environmental costs into investment decisions.
- Encourage research on the environmental impacts of the mineral industry, reclamation, processing technology, and potential effects of effluents.
- Improve testing and monitoring of effluents.
- Comply with all applicable environmental legislation.
- Design products that can be recycled and that minimize waste.

B. Workplace Safety

Workplace safety is a major concern to both industry and government. The industry can pursue practices that contribute to safer working conditions.

C. Public Education and Consultation

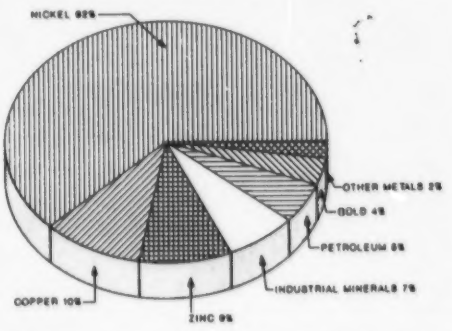
The public should understand the contributions of the minerals industry. There should be dialogue between the industry and the public. The industry could develop programs and forums for the exchange of information with the public.

D. Conservation

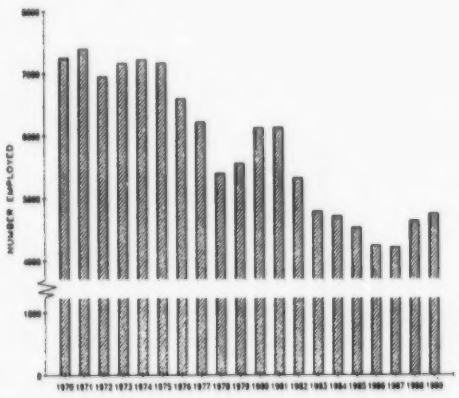
Mineral resources are non-renewable. The industry can develop programs to recycle mineral products, conserve energy, and maximize resource recovery practices.

SOME FACTS TO CONSIDER ...

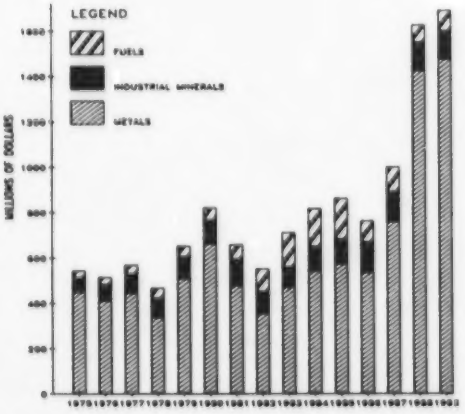
- The mineral industry of Manitoba is made up of the mining sector, which includes metals and industrial minerals, and the petroleum sector.
- Approximately 34 square kilometres (13.1 square miles) of the province are currently used for metal and petroleum production. This is less than 6% of the 566 square kilometres (218.5 square miles) occupied by the City of Winnipeg. Since 1900, the total area devoted to metal production has only been 52 square kilometres (20.1 square miles).
- Manitoba's mineral industry is the province's second leading primary resource industry next to agriculture.
- Over the past 5 years, the total value of mineral production in Manitoba has averaged $1.2 billion per year.
- In 1989, Manitoba produced 34% of Canadian nickel, 15% of the cobalt, 7% of the copper, and 5.5% of the zinc. North America's only production of tantalum, spodumene, and cesium ores is at Bernic Lake in southeastern Manitoba.
- Revenue to the Province from direct mineral taxes, royalties, and fees has averaged $67 million per year over the past 5 years.
- Manitoba's mining and petroleum sectors directly employ 6400 persons.
- The economic benefits of mineral production affect all areas of the province. The industry provides the principal economic base for such northern communities as Thompson, Flin Flon, Snow Lake, Leaf Rapids, and Lynn Lake. The industry also makes a significant contribution to the economies of southern Manitoba such as Waskada, Lac du Bonnet, Mafeking, Stonewall, and Virden.
- The mineral industry is sensitive to supply and demand for mineral commodities in the international market place.
- Mining headframes in Manitoba are comparable in size and shape to grain elevators. Currently, there are 16 headframes compared to 284 primary grain elevators.
- Fifty percent of Manitoba's crushed stone, sand, and gravel is used in road construction.
- Since the late 1800's, the major source for sand and gravel for Winnipeg has been the Birds Hill esker complex.
- The Virden area was the site of the first commercial oil-producing well in North America's Williston Basin in 1951.
- All of Manitoba's crude oil production leaves the province in an unrefined state. Manitoba crude oil production is equivalent to 25% – 30% of the Province's refined petroleum products requirements.



Value of mineral production in Manitoba ($1.7 billion)



Employment at metallic mineral operations in Manitoba



Value of mineral production in Manitoba (1975 - 1989)

History of Mineral Development

Archaeological data, historical records, and current events all point to the importance of minerals in our social, political, and economic growth.

The Archaeological Data

Archaeological data tell us that early men and women quarried and used minerals. As time passed people used a greater variety of minerals, and they used them in more sophisticated ways. In Manitoba, people quarried flints for spear and arrow tips, scrapers, and knives. They fashioned clay into cooking and eating utensils and made storage vessels. They recovered natural salt by evaporating brine in bark containers.

Early Days in the Mineral Industry

The first written record of mining in what was to become Manitoba dates back to 1739. In that year La Verendrye's son, Louis-Joseph, visited Black Island in Lake Winnipeg. There people were quarrying an exposed hematite deposit to obtain red ochre. They used it for body paint and in various ceremonies.

Salt was the first mineral to be produced commercially. In 1818, James Monkman and other former employees of the Hudson's Bay and North West fur trading companies began supplying salt to the Red River Settlement. They extracted the salt from natural brine pools located near the west shores of Lake Winnipegosis.

Building Manitoba

The production of construction materials was an important activity in the early Red River Settlement. Dolomitic limestone was quarried during the 1830's in the Parish of St. Andrew. The settlers used the limestone to build public and private buildings. St. Andrew's Church and Rectory, Twin Oaks, Kennedy House, and Lower Fort Garry built on the banks of the Red River north of Winnipeg are all constructed from local limestone.

By the turn of the century the distinctive "Tyndall" stone was commercially quarried in Garson. Several companies made bricks from local clays. Gypsum was mined in the Interlake, cement was manufactured southwest of Winnipeg, and coal was extracted from mines near Turtle Mountain. Aggregate was produced throughout the province and used in road building, as construction fill, and in the manufacture of concrete.

Geological Exploration

Systematic geological investigations of the province began in the mid – 19th century with the Hind and Palliser expeditions. When Manitoba entered Confederation in 1870, the federal government pledged to continue geological surveys of the new province. In 1896, Joseph Tyrrell led the first exploration of a portion of the "greenstone belt" in the Flin Flon/Snow Lake area. Further work in 1899 led to a prediction that base and precious metals would be found in the region.

The Search for Metals Opens the North

The search for precious and base metals and the expansion of the province's boundaries in 1912 shifted the emphasis of minerals exploration to the north. The well-known Mandy copper deposit was found near Flin Flon in 1915. Gold-bearing ore was shipped from the Snow Lake area in 1917. Later exploration revealed significant deposits of copper, zinc, nickel, and gold. These discoveries led to the development of the Flin Flon mining and processing complex in 1930. Then in 1961 a world-class nickel processing facility was established at Thompson. In 1969, North America's only tantalum mine began production at Bernic Lake in southeastern Manitoba.

Commercial production of mineral resources literally opened Manitoba's north country. Townsites like Flin Flon, Thompson, and Snow Lake were built as a result of mineral discoveries. Commercial, educational, and recreational facilities grew up to serve the families who lived in these new mining communities. Rail and road transportation networks were built. Hydroelectric services were established. Communications facilities were installed.

Finding Oil

The search for petroleum resources began in 1877 with the drilling of an oil well near Dauphin. However, it was in 1951 that the first commercially viable source of oil was found near Virden. This discovery led to more exploration in southwestern Manitoba and the development of 12 oil fields. During the early 1980's continuing exploration resulted in significant finds in the Waskada and Pierson areas.

GLOSSARY

Aggregate: Sand, gravel, and crushed stone.

Base Metals: A specific group of non-precious metals which includes copper, lead, zinc, and nickel.

Decommission: The act of closing a mine that is uneconomic and ensuring that the mine site is safe and environmentally stable.

Ecosystem: A community of organisms functioning and interacting together with their physical environment.

Environmental compatibility: Any air, land use, water use, and/or habitat condition that harmonizes with, rather than detracts from, competes with, or degrades surrounding air quality, land use, water use, and/or habitat.

Environmental enhancement: Measures undertaken to improve the quality of the environment such that its ability to support a variety of living organisms or other uses is renewed or strengthened.

Environmentally sound: The maintenance or promotion of the well-being of naturally occurring living organisms and their habitats rather than causing abrupt disruptions or including long term stresses that impair either vitality or reproduction.

Full cost accounting: The tally of all factors, including economic, socio-economic, ecological, environmental, reclamation, and rehabilitation, as costs charged against the benefits of a particular development.

Incentives: Monetary and non-monetary inducements designed to influence the behaviour of companies and individuals.

Industrial Minerals: A general term referring to non-metallic minerals, including silica sand, gravel, limestone, gypsum, and granite, used largely in their natural state in the chemical, manufacturing, and construction industries.

Mineral: Naturally occurring elements or compounds having unique physical properties and chemical composition.

Mineral Development: Refers to activities associated with exploration, site development, processing, and marketing of minerals.

Petroleum: A complex mixture of hydrocarbons found in rock strata which is normally recovered through a well.

Precious Metals: The relatively scarce and valuable metals such as gold, silver, and the platinum group metals.

Rehabilitation: The act of restoring lands damaged or degraded by mineral development to a state which is safe, stable, and environmentally compatible with adjacent lands.

Royalty: The amount paid by a mineral producer to the owner of the land (Crown and private) or mineral rights based on a certain amount per unit of product taken out of the land.

Tenure: The terms and conditions upon which mineral rights are assigned.

YOUR COMMENTS ARE NEEDED

Please consider the mineral policies presented in this booklet. We would like to receive comments and suggestions from as many people as possible. Your comments will assist in further development and refinement of the policies.

Please complete the attached questionnaire and return it to the address provided.

Thank you for your help !

An Invitation To Participate

PHASE 1
PREMIER ANNOUNCES LAND AND WATER STRATEGY -- NOVEMBER, 1988

PHASE 2
DIALOGUE ON SOIL, WATER, AND FOREST POLICIES

PHASE 3
RELEASE OF MINERALS WORKBOOK

PHASE 4
WORKSHOPS
BROAD BASED PUBLIC DIALOGUE ON MINERAL POLICIES

PHASE 5
MINERAL POLICIES REVISED AND RELEASE OF "WHAT YOU TOLD US"

PHASE 6
MINERAL POLICIES FINALIZED

PHASE 7
ADDITIONAL WORKBOOKS

Complete the Workbook...

Workbooks are a way of letting us know what you think. They list draft policies on a range of resources and are designed to encourage comments and suggestions for refining the policies. This workbook discusses our mineral resources. Workbooks on water, soil, and forests have already been published. Additional workbooks will be prepared for discussion at a later date.

Every Manitoban will be given the opportunity to present ideas and concerns. **Let us know what you think!**

"Thank you for investing your time and energy in working toward a land and water strategy for Manitobans"

Premier Gary Filmon

Need more information or have additional comments?
Contact:
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305 - 155 Carlton Street Winnipeg, Manitoba R3C 3H8
Phone: Winnipeg 945-1124
Outside Winnipeg 1-800-282-8069